

Maritime Museum of San Diego
MAINS'L

Vol. 47:1 & 2 Winter/Spring 2011
HAUL

\$11.95

A Journal of Pacific Maritime History



PREHISTORY

Pacific Seafarers and Maritime Cultures

The Deep History of Pacific Seafaring

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*Photos from inside front cover
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Introduction

For those who live along North America's west coast – swimming, sailing, fishing, and surfing in the waters of the Pacific – the history of seafaring and coastal settlement should be of great interest. Most Pacific Coast residents probably have some idea that maritime peoples plied these waters for millennia past. Some may remember bits and pieces from grade school or local museums about Pacific Coast Indian tribes, Cabrillo's famous voyage of exploration in 1542-1543, or the local history of whaling, fishing, or shipbuilding industries. Others may have read books or magazine articles about such topics or seen recent documentaries that hint at major changes in our understanding of the antiquity

of seafaring and human settlement in the Pacific. For too many, however, a deeper history of seafaring in the vast expanse we now call the Pacific Ocean is largely lost in the rush of modern living.

For most of the twentieth century, boats, seafaring, and maritime societies in the Pacific (and around the world) were thought to be very late developments in human history, limited to the last 10,000 years or so (Bass 1972; Greenhill 1976; Johnstone 1980; Osborn 1977; Yesner 1987). This is just four-tenths of one percent of the 2.5 million years our genus (*Homo*) has existed and the last 5 percent of the time we (*Homo sapiens sapiens*) have graced the earth. If our ancestors didn't fish or forage along coastlines, cross water barriers, or colonize islands for 2.49 million years, how did they spread around the world? How and when did humans colonize the coastlines and islands of the Pacific?

The answers to these questions have changed in recent decades, and much of what I learned about the archaeology of seafaring as a college student in the 1970s and 1980s now appears to have been wrong. More recent summaries by archaeologists and maritime historians now recognize a deeper history for coastal adaptations, human seafaring, and maritime migrations (Anderson et al. 2010; Bailey 2004; Erlandson 2001, 2002; McGrail 2001). Why did scholars misinterpret the antiquity of maritime peoples for so long? The answer lies in the fundamental problem

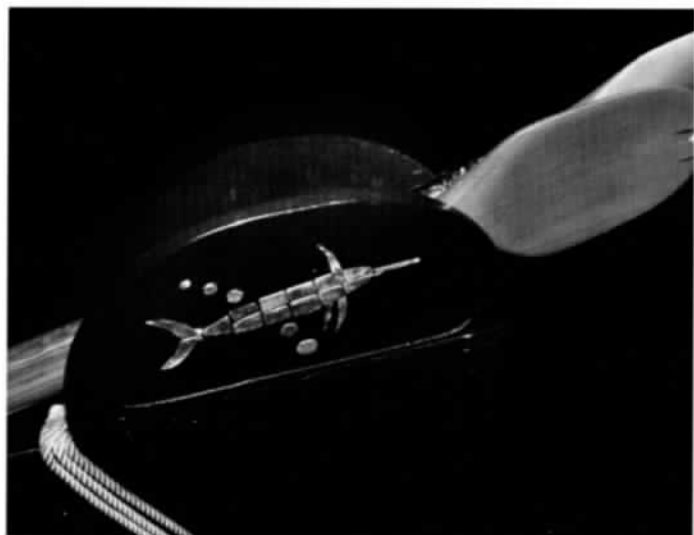
Jon Erlandson was born and raised in Southern California and Hawaii. He earned his B.S. (1980), M.S. (1983), and Ph.D. (1988) degrees from the University of California, Santa Barbara, and has spent most of his career studying the archaeology of maritime peoples on California's Channel Islands, the Pacific Coast, and around the world. He has taught at the University of Oregon for the past 20 years, where he is a Professor of Anthropology, Executive Director of the Museum of Natural and Cultural History, senior editor of the *Journal of Island and Coastal Archaeology*, and one of the world's experts in the archaeology of seafaring and maritime peoples. His 2008 book, *A Canyon Through Time*, summarizes the human and natural history of Tecolote Canyon west of Santa Barbara, where the Bacara Resort was built.

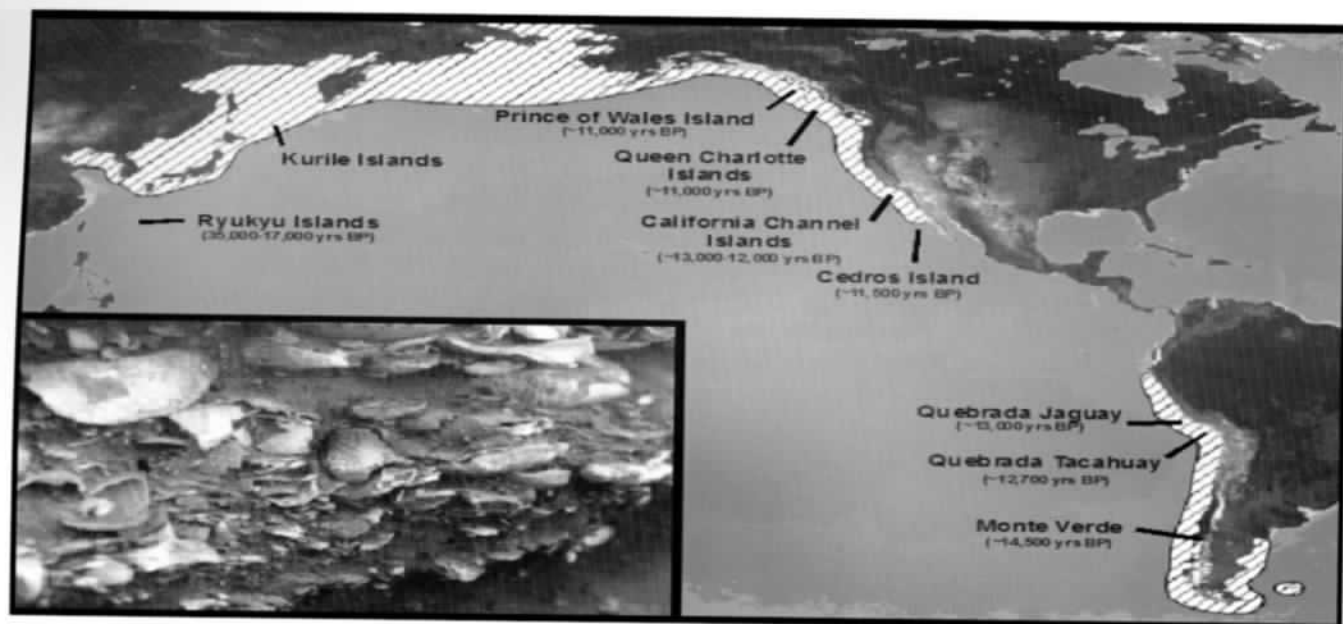
that humans evolved and spread around the world during the Pleistocene (~1.8 million to 11,000 years ago), a period dominated by heavy glaciation and dramatic changes in global sea-level and coastal geography. Bailey et al. (2007) estimated that sea-levels were 50 meters (164 feet) or lower than present during 90 percent of the Pleistocene. Unfortunately for those interested in the deep history of seafaring, we live in an interglacial period when sea levels are relatively high (and still rising!), leaving most ancient coastlines deeply submerged and far offshore.

In this brief essay, I provide some archaeological background to the maritime history of the Pacific. I show that seafaring and coastal economies have much deeper histories than once believed, that the Indo-Pacific may be the primary hearth for long-distance voyaging, and that the Pacific was the scene of some of the most amazing maritime migrations in human history. I have written extensively about these and related topics elsewhere (see Erlandson 2001, 2002, 2010a, 2010b), where a wider range of original sources are available to interested readers.

Origins of Seafaring

Although the oldest boat remains are less than 10,000 years old, a growing body of evidence has emerged in recent decades for a relatively early development of seafaring in the Pacific (see Anderson et al. 2010). In Island Southeast Asia, it now appears that *Homo erectus* reached the Indonesian island of Flores (and possibly Timor) by ~750,000 to 800,000 years ago, after saltwater crossings as much as ~20-30 km long. These voyages may have been accomplished on relatively simple rafts and there is little secure evidence for seafaring by *Homo erectus* (or archaic *Homo sapiens*) elsewhere in the world. Media reports in 2010 of possible Acheulean handaxes on the Mediterranean island of Crete may alter that situation, but the fact that *Homo erectus* never settled Australia suggests that marine voyaging capabilities were limited until the appearance of anatomically modern humans (AMH; see Erlandson 2002).





The "kelp highway," shows the modern distribution of kelp forest ecosystems around the Pacific Rim and the location and age (in calendar years) of early archaeological sites. Adapted from Erlandson et al. 2007; original drafted by M. Graham; inset shows mussel, abalone, and sea urchin shells from a shell midden on San Miguel Island.

Courtesy of the Author

Evidence for early seafaring by AMH is much more compelling and widespread, involving the dispersal of humans across a number of significantly larger water barriers, especially in Eastern Asia, Australia, New Guinea, and Melanesia. During glacial periods, the geography of Southeast Asia, New Guinea, and Australia was transformed as lower sea levels exposed broad expanses of now submerged continental shelves and connected many modern islands into larger land masses. Even in full glacial times the larger landmasses known as Sunda (continental Southeast Asia) and Sahul (Australia, Tasmania, and New Guinea) were separated by a series of deep straits, however, with strong currents creating a major biogeographic barrier. Crossing from Sunda to Sahul through the islands of Southeast Asia was a formidable journey that sometimes took early seafarers over the horizon and beyond the sight of land.

Until the 1970s, it appeared that humans did not reach Australia until near the end of the Pleistocene. Since then, archaeologists have extended the antiquity of human settlement in Sahul to 33,000 years ago, 40,000 years ago, and now $\sim 50,000 \pm 5,000$ years ago (see Anderson et al. 2010). Crossing from Sunda to Sahul required multiple voyages, some of them at least 80-90 km long (~ 43 nmi or more). For a decade or two, some scholars clung to the idea that the peopling of Australia was accidental, but the discovery

of Pleistocene shell middens in western Melanesia dispatched any reasonable doubts about the deliberate nature of such voyaging. Settlement of the Bismarck and Solomon islands from about 40,000 to 30,000 years ago involved several additional voyages beyond those required to reach Sahul. Colonization of the Solomons required voyages of at least 140 km and possibly 175 km (Irwin 1992). By $\sim 20,000$ years ago, Melanesian seafarers also reached the Admiralty Islands, a voyage of 200-220 km, 60-90 km of which would have been completely out of sight of land. These early Melanesian sites, located along shorelines with very steep bathymetry, remained near the coast even during the Last Glacial Maximum (LGM) when sea levels were ~ 125 meters (~ 410 ft.) lower than today. Recent research on the islands between Sunda and Sahul is also providing additional evidence for Pleistocene seafaring in the islands of Wallacea between Sunda and Sahul, including a shell midden with numerous tuna bones from Jeramalai Cave on East Timor dated to about 45,000 years ago (Anderson et al. 2010).

Further evidence for Pleistocene seafaring by AMH comes from Okinawa and other Ryukyu Islands off the East Asian Coast. Located between Taiwan and Japan, which were both connected to the Asian mainland during LGM, the Ryukyu Archipelago is separated from Asia's continental shelf by deep oceanic straits. Human bones from Yamashita-cho, Minatogawa, and other caves on Okinawa and Miyako islands have been

dated between about 35,000 and 17,000 years ago. Colonizing Okinawa and Miyako required voyages up to 75 km and 150 km long, respectively (Erlandson 2002). In Japan, evidence for Pleistocene seafaring also comes from obsidian artifacts originating from a volcanic flow on Kozushima Island—located ~25–30 km off the Honshu Coast during the LGM, which have been found in ~25,000 to 30,000-year-old Japanese sites. This places competent mariners in the cool waters of the North Pacific early enough to have contributed to the initial colonization of the Americas (Erlandson 2002, 2010a,b). From northern Japan the Kurile Islands stretch to the northeast like stepping stones to Kamchatka and the southern shores of Beringia. Whether Pleistocene seafarers followed this route remains to be seen and the evidence that could resolve the issue, like so many questions related to the evolution of maritime adaptations, lies submerged (and largely unstudied) on the continental shelves of the North Pacific.

A Kelp Highway? From Asia to the Americas

Twenty years ago, most scholars thought that Native Americans were descended from terrestrial hunters who marched from northeast Asia through the frigid plains of Beringia, then down a long “ice-free corridor” connecting Alaska and the Yukon to the heartland of North America. These intrepid hunters were thought to have arrived about 13,000 years ago, spreading rapidly through the uninhabited continental interior in search of mammoths and other large mammals, leaving a trail of Clovis points, kill sites, and campsites behind them. In this scenario the Pacific Coast was largely irrelevant to the Pleistocene colonization of the Americas since it wasn’t thought to have been settled until several millennia after the megafauna were hunted to extinction and people were forced to adapt to coastal habitats and ‘inferior resources’ such as fish and shellfish.

The alternative coastal migration theory (see Erlandson 1994, 2002; Cassidy, this volume) lurked in the shadows of American archaeology for decades. Discovery of the ~14,000-year-old Monte Verde site in Chile and the 14,300 year old Paisley Caves in Oregon has elevated the coastal migration theory to the forefront of current debate about how and when the Americas were colonized, especially after geological research suggested that the ice-free corridor may not have been passable until after about 14,000 years ago. It now appears that the Northwest Coast route opened a millennium or two earlier than the ice-free corridor and that the diversity and richness of coastal ecosystems after the LGM may have created a “kelp highway” that facilitated a maritime migration from northeast Asia into the Americas (Erlandson et al. 2007). A coastal route around the Pacific Rim – linear, entirely at sea level, and without major geographic barriers – featured similar types of shellfish, fish, seabirds, sea mammals, and seaweeds, as well as terrestrial plants and animals from adjacent landscapes.

The coastal migration theory has also gained credibility as increasingly older sites have been found along the Pacific Coast of the Americas. These include a growing number of Paleocoastal sites from California’s Northern Channel Islands (e.g., Arlington Springs, Daisy Cave, Cardwell Bluffs) dated between 13,000 and 11,400 years ago (see Erlandson 2007; Erlandson et al. 2008; Johnson et al. 2002). These sites currently provide the earliest evidence for systematic seafaring, island colonization, and marine hunting, fishing, and shellfish collecting in the New World.

Polynesians in the Pacific

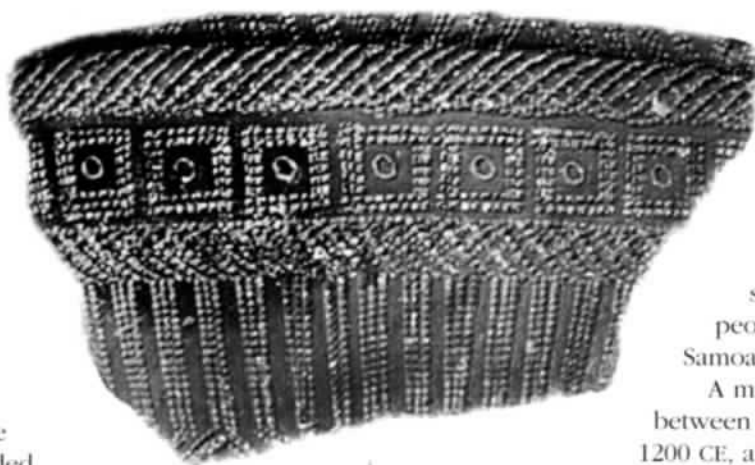
As impressive as these Pleistocene maritime migrations were, they were limited to coastal waters or islands that could be reached via sea crossings of roughly 200 km or less. Significantly longer voyages, such as those involved in the settlement of the remote islands of the Indo-Pacific, appear to have been limited to the past 4,000 years or so. These longer oceanic voyages may have posed technological and logistical challenges that could not be overcome until more sophisticated boats were developed, along with the agricultural products needed to survive on more remote and biologically depauperate islands.

One of the best examples of such fully oceanic migration involves the dispersal of Austronesian-speaking peoples from Southeast Asia into island archipelagos scattered through the vast expanses of the Indian and Pacific oceans. In an area spanning nearly half the globe – from Madagascar to Rapa Nui (Easter Island) and beyond – archaeological, linguistic and genetic data illuminate one of the most amazing migrations in human history. The origin of Austronesian peoples is still debated, but probably involved maritime agriculturalists moving out of Southeast Asia ~5,000 to 6,000 years ago. One branch of Austronesians moved westward along the south coast of Asia and the east coast of Africa, traveling as far as Madagascar by about 2,000 years ago. Roughly 3,500–4,000 years ago another group of Austronesians settled the thousands of islands of Micronesia, including the Palau, Mariana, Caroline, Marshall, Kiribati, and Tuvalu islands (Kirch 1997). A third branch, marked by a trail of distinctive decorated ceramics, is known as the Lapita dispersal.

Lapita sites in New Guinea, the Bismarck Archipelago, and the Solomon Islands date between ~3,500 and 3,200 years ago. Shortly thereafter, Lapita peoples began to colonize more distant island groups in Melanesia, reaching the Santa Cruz Islands after a voyage of nearly 400 km (~216 nmi), then the Vanuatu Islands and New Caledonia. By roughly 3,000

Below: A decorated Lapita potsherd, diagnostic of Lapita archaeological sites in New Guinea, Melanesia, and western Polynesia dated between about 3,500 and 3,000 years ago.

Photo adapted from Te Ara: The Encyclopedia of New Zealand: <http://www.teara.govt.nz/>



years ago, Lapita peoples reached Fiji after sailing 850 km against the prevailing winds and currents. Sailing still further east, Lapita peoples also settled Tonga, Samoa, and nearby islands.

A millennium or so later, between about 500 and 1200 CE, a maritime radiation of

fully Polynesian peoples resulted in the settlement of virtually every habitable island of remote Oceania. This rapid migration of Polynesian peoples included voyages of up to 2,000 km and the human colonization of some of the most isolated islands on earth, including Hawai'i, Aotearoa (New Zealand), and Rapa Nui. Archaeological and genetic (DNA) evidence suggests that Polynesians also made contact with Native American peoples along the Pacific Coast of South America ~3,500 km east of Rapa Nui, transmitting the Polynesian chicken to the Americas and carrying American sweet potatoes and gourds back to Polynesia. Jones and Klar (2005) even proposed that Polynesian seafarers contacted Native peoples of the southern California Coast, but the evidence for such contacts remains controversial.

Conclusions

Archaeological evidence for the deep history of seafaring in the Pacific has expanded dramatically in the past 20 years, extending the antiquity of the earliest sea voyaging to as much as 800,000 years. Roughly 50,000 years ago, seafaring appears to have expanded significantly in scope and sophistication with the appearance of AMH in Island Southeast Asia, leading to the first human colonization of Australia, New Guinea, western Melanesia, and the Ryukyu Islands. These Pleistocene seafarers may have continued moving along the shores of the Pacific Rim, reaching North America roughly 15,000 years ago and South America at least 14,000 years ago. Seafaring took another great leap forward after about 4,000 years

ago, when maritime agricultural peoples equipped with catamarans, sails, and domesticated plants and animals ventured into the remote Pacific to settle thousands of islands of Micronesia, eastern Melanesia, and Polynesia. These ancient maritime migrations to Australia, the Americas, and the Pacific, accomplished with Stone Age technologies but with great courage and human ingenuity, represent three of the most significant migrations in human history. Unfortunately, with global warming and sea-level rise accelerating, the archaeological records of these amazing maritime migrations and cultures is increasingly threatened by coastal erosion (Erlandson 2010c).

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